Vol. 11. Part 9. Pp. 127–142. 15th September, 1942

THE PROCEEDINGS

OF THE

ROYAL ENTOMOLOGICAL SOCIETY OF LONDON

Series B.
TAXONOMY

(being the continuation of Stylops)

World List abbreviation: *Proc. R. ent. Soc. Lond.* (B)

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PUBLISHED BY THE SOCIETY AND

SOLD AT ITS ROOMS, 41, QUEEN'S GATE, S.W.7

Price 4s. 0d.

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REVISIONAL NOTES ON MELANESIAN *EUPLOEA* (LEP.) WITH DESCRIPTIONS OF NEW SUBSPECIES AND FORMS

By Professor G. D. Hale Carpenter, M.B.E., D.M., F.R.E.S.

Butterflies of the genus *Euploea* (*sens. lat.*) in the area known by the convenient, if strictly unscientific, name of " Melanesia " have for some years been the subject of an intensive study in which I proposed to ascertain the limits of variation in the spotting, and the geographical range and variations of each species represented in that area, which may roughly be described as extending from the Bismarck Archipelago and eastern end of New Guinea south-eastwards to Fiji. The large collections at Oxford, Tring, and South Kensington have been fully utilised, and a collection of 150 specimens was sent me for study by the kindness of the American Museum of Natural History. I have also, during visits to Berlin and Munich in 1938, seen the collections in those places. Altogether, about 5500 *Euploea* from the area concerned have been closely examined.

A preliminary account (Carpenter 1940) was communicated to the Pacific Science Congress at San Francisco, 1939.

The outbreak of war put a stop to the work. But as a number of new forms, and certain mistakes needing correction, had been found it seemed better to deal with them at once and not to wait for the completion of the full paper. I am greatly indebted to the Keeper of Entomology, British Museum (Natural History), and to Dr. Karl Jordan, F.R.S., who was in charge at Tring when the work was done, for facilities for making the fullest use of the rich material in their charge : Dr. A. S. Corbet, Mr. A. G. Gabriel, Mr. F. Goodson, and Mr. G. Talbot have been kindly helpful.

The arrangement, and nomenclature, here used are according to Hulstaert *in* Wytsman 1931, *Genera Insectorum* **193**. I have found it best to describe the spots as comprising three series, running across the wing. The outermost, along the edge, I term *admarginal*; the innermost, in a row round the end of the cell, *discal*; and the intermediate row, *submarginal*. In addition there may be a spot within the apical half of the cell, but it is absent from many species. The admarginals are small and, typically, paired and may extend from area 1a to area 8 on the fore-wing, 1a to 7 on the hind-wing : sometimes they are absent from area 4 on the fore-wing although otherwise well represented (e.g. *helcita* forms). The submarginals on the fore-wing are often only represented near the apex on the upperside : these are by some authors described as apical or sub-apical.

It should be noted that, on the fore-wing, the line of spots when fully developed in areas anterior to 7 curves towards the base at a right angle as far as 10 or even 11 owing to the disposition of the areas along the costal margin. The submarginal series may extend from 1b to 8 : the spots at the bases of 9, 10 and even 11 belong to the discal series. It is a character of some species that the spot is absent from area 3 (*cerberus*). On the hind-wing the submarginals are of two types. There is a single, rounded, spot in each of the areas 4, 5, 6 and sometimes 7, of which the first three may be the only submarginals showing on the upperside. From area 1b to 3 the submarginals are elongated, and paired, although often one of the pair only may be represented, when it is recognisable by its position to one side of the mid-line. The pair may be joined at their inner ends, or along their contiguous sides, to form a single

large blotch, notched proximally and distally. The discal series on the fore-wing may be represented above by only the spot in 10, usefully known as "costal 10," or may be entirely absent from both sides. They are often elongated, and, like those on the hind-wing, may show a blue or purple tint absent from the submarginals and admarginals. The discals of the hind-wing rarely show on the upperside: below they may extend from 1b to 8, more usually 1c to 7, the extremes in the series being much narrower in form. The spot may be absent from area 6 in even a highly spotted specimen.

Various degrees of fusion between members of a series, or of adjacent series, may occur and produce striking patterns.

In some cases I have shown the range of variation of spotting by citing maximal and minimal development for male or female: these are the results of detailed examination of very many specimens.

1. *Euploea* (*Vonona*) *climena* Stoll *in* Cramer 1782.

Fruhstorfer, *in* Seitz (: 227), places *mangoensis* Butler as a form of *climena* which is certainly not correct. It is the form of *boisduvalii* Lucas 1853 occurring in the eastern isles of Fiji, far beyond the range of *climena*.

2. *Euploea* (*Vonona*) *bigamica* Strand 1914.

The male type, in the British Museum, from Bougainville Island, is quite certainly a form of *honesta* Butler 1882. It has the brand on the fore-wing unusually short and narrow, being in length only one-quarter of the length of vein 2, but this is matched by another specimen in the British Museum from Aola. The spotting is as follows—Upperside, fore-wing, discal series, a small oval in 3, narrow streak in 4, streak in 6. None on hind-wing. Underside, fore-wing, discal series, oval 2 and 3, streaks in 4, 5, 6: cell spot present. Hind-wing, discal series, streak in 1c, spots in 2–6: cell spot present.

Strand's female type of *bigamica*, also from Bougainville, is unique; I have seen nothing like it: the spots of the underside almost suggest that it is a hybrid between *honesta* and *asyllus* Godman & Salvin 1888, though this seems extremely unlikely. Upperside like other *honesta* females. Fore-wing, discals, a minute 3 and a small elongated 4: cell spot present. Hind-wing, no spots. Underside shows marked differences from *honesta*. Fore-wing, traces of admarginals in 3 and 4: submarginals, 2–8. Discals 2, 3, 4 are large, 6 small, and costal 10 present which is never the case in *honesta*. A large cell spot. Hind-wing, admarginals, a pair in each area from 3–6, increasing in size anteriorly. Submarginals, one of a pair in 2, pairs in 3–4, single spots in 5, 6, and 7, the last being minute. Discals, a linear 1c, spots 2–7. Cell spot present.

3. **Euploea (Vonona) honesta** f. **apicalis** form. n.

Type male in the Tring Museum (*A. S. Meek*), San Christoval, Solomon Isles, 19.iv.–9.v.1908.

Upperside, fore-wing. Spotless: a white apical patch extends from about the middle of area 10 to vein 3, being narrower and slightly suffused with brown in area 3. The white patch is separated from the margin by a narrow dark brown area, just leaving the base of area 7 white. Hind-wing also spotless: a broad marginal area decidedly paler than is usual in *honesta* extending inwards half the distance from the margin to the apex of the cell. Underside, fore-wing. The white area reaches the margin of the wing and extends back just across vein 2, narrowing posteriorly. There is the typical elongated white streak of *honesta* in 1b; discals 2, 3, 4 all small, and cell spot reduced to a minute point. Hind-wing. A narrow white border extends inwards two-fifths of the distance from margin to apex of cell. Discals 2, 3 very small, 4, 5, 6 larger. Cell spot small. A

second male specimen, a paratype, in the British Museum (N.H.) at South Kensington bears the label (certainly erroneous) "Australia—Leggatt. 1902—236". Someone has rightly been suspicious of this and appended another label " ? Ugi Is.", which is a very likely locality. The paratype very closely resembles the type, except that the white apical patch does not extend further back than vein 4. The pale marginal band on the hind-wing contains a pair of submarginal spots in 1c, repeated faintly in 2 and more faintly in 3. The underside resembles that of the type but on the fore-wing the cell spot and discals 2, 3, 4 are larger and conspicuous.

This white-tipped form is of interest because it seems to be an approach to the strongly white-marked species *brenchleyi* Butler 1870 of the same localities (Carpenter 1940 : 308). There is quite a likeness to *woodfordi* Godman & Salvin 1888, which is probably derived from *honesta*, occurring on another of the Solomon Isles, Maleita; but the white margin of the hind-wing differs from that of *woodfordi* by being continued forwards to the costal angle of the wing, whereas in *woodfordi* it fades away at vein 4 or 5. Moreover, *woodfordi* does not have a white margin to the fore-wing beneath.

It is appropriate to mention here that two forms attributed to *honesta* by Hulstaert, namely *prusias* and *pronax* described as species by Godman and Salvin in 1888, should be attributed to *nechos* Mathew 1887. The relationship with *nechos* is obvious at sight: one can only conclude that Hulstaert never saw specimens.

4. *Euploea* (*Vonona*) *cerberus* Butler 1882.

Described from New Britain. Hulstaert *in* Wytsman 1931, *Genera Insectorum* **193** : 115, says it is probably a race of *alecto* Butler 1866, but it seems to me a definite entity characteristic of the Bismarck Archipelago, though occurring, less abundantly, in New Guinea. As there is considerable resemblance between this species and *obscura* Pagenstecher 1894, it will be useful to state here differences noted in the examination of very many specimens.

Upperside. The spotting on *cerberus* is much more definite: the fore-wing is more strongly lobed on the inner margin, and the sex-patch on the hind-wing is neither so large nor so distinctly marked. On the hind-wing *cerberus* never has more submarginals than 4, 5, 6, while *obscura* often has. The outer part of the fore-wing of *cerberus* is paler than the rest: in *obscura* the coloration is more uniformly darker brown.

Underside. The admarginals of the hind-wing are well developed in *cerberus*, very poorly in *obscura*. Discal 2 always present on fore-wing of *cerberus*; absent from *obscura* (with extremely rare exceptions). Discal 5 almost always absent from fore-wing in *cerberus*, often present in *obscura*.

There is a form of *cerberus* on Mathias Island of which six males and a female are in Tring Museum, captured by F. Eichhorn, June–July, 1923. They show sufficient characteristics to be distinguishable, and I here describe them.

Euploea (Vonona) cerberus griseitincta subsp. n.

The six males, syntypes, show a distinct grey-brown tint towards the apex of the fore-wing: in spotting they do not differ from *c. cerberus*, varying between the extremes set out below.

Maximal. Upperside. Fore-wing. Submarginals 2–6. Hind-wing. Submarginals 5–6. Underside. Fore-wing. There is, in addition to the white inner margin, a white streak in 1b, more developed than is usual in *cerberus*. Submarginals 1b–8. Discals, streak in 1b, spots 2–6 but 5 very minute. Cell spot present. Hind-wing. Admarginals, one 3, pairs 4–5, one 6. Submarginals, 4–7. Discals, 1c–7. Cell spot present.

Minimal. Upperside. Fore-wing. Submarginals 3–6. Hind-wing. Submarginals

5–6. Underside. Fore-wing. Submarginals 2–6. Discals 2–4. Cell spot present. Hind-wing. Submarginals 4–6. Discals 2–6. Cell spot present.

A single female from the same locality is at Tring; it has the same coloration as the male. The spots on the under surface are relatively larger than in *c. cerberus*. Fore-wing. Submarginals 2–7. Discals 2–4. Cell spot present. Hind-wing. Admarginals, pairs 4, 5, single 6. Submarginals. In addition to the usual 4, 5, 6 and a minute 7, there is a single 2, and a pair in 3 which are not seen in *c. cerberus*. Discals 2–7. Cell spot present.

5. **Euploea helcita lauensis** subsp. n.

For description by G. Talbot, see p. 139.

6. *Euploea* (*Crastia*) *eleutho* Godart 1824.

Fruhstorfer, *in* Seitz (**9** : 241), placed *proserpina* Butler 1866 under *eleutho*. It is, of course, a characteristic Fijian form of *boisduvalii* Lucas 1853.

7. *Euploea* (*Crastia*) *illudens* Butler 1882.

The type male comes from New Ireland, the type female from Duke of York Island. Butler at the same time distinguished another male and female from Duke of York Island as *decipiens*. I have seen these types and compared them with very many specimens of *illudens* and find *decipiens* to be only weakly-spotted specimens of *illudens*. Since *decipiens* comes after *illudens* in the same paper by Butler it can be sunk as a synonym. Similarly, *lygdamis* Fruhstorfer (Seitz **9** : 243) from New Mecklenburg sinks as only a large, well-spotted, specimen of *illudens*.

		Admarginals	Submarginals	Discals	Cell spot
Type ♂ *illudens*	Above F.W.	Nil	Minute 3, 4, 7, larger 5, 6	Nil	Nil
	Above H.W.	Nil	Nil	Nil	Nil
	Below F.W.	Nil	3–8	Diffuse 2, clearer 3, 4, minute 6	Present
	Below H.W.	Pairs 4, 5, one 6	4, 5, 6	1c–7 (7 minute)	Present
Maximal ♂ *illudens*	Above F.W.	Nil	3–7	Nil	Nil
	Above H.W.	Nil	½ pair 2, pair 3, singles 4, 5, 6	Nil	Nil
	Below F.W.	Nil	3–8	2, 3, 4, streak 5–6	Present
	Below H.W.	Pairs 4, 5, 6	½ pair 2, pair 3, singles 4, 5, 6	1c–7 (extremes linear)	Present
Minimal ♂ *illudens*	Above F.W.	Nil	Nil	Nil	Nil
	Above H.W.	Nil	Nil	Nil	Nil
	Below F.W.	Nil	4–7, minute	2, 3, 4	Small
	Below H.W.	Nil	4 (minute), 5, 6	2, minute 3, 4, 6	Very small
Type ♂ *decipiens*	Above F.W.	Nil	Nil	Nil	Nil
	Above H.W.	Nil	Nil	Nil	Nil
	Below F.W.	Nil	Small 3, 4, 6, 7 (5 absent)	Diffuse 2, very small 3, 4	Very small
	Below H.W.	Nil	4, 5, 6	1c–6 all small, but 2 and 6 less small	The largest spot on H.W.
Type ♂ *lygdamis*	Above F.W.	Nil	3, 4, trace 5, 6, 7	Nil	Nil
	Above H.W.	Nil	5, 6	Nil	Nil
	Below F.W.	Nil	3–7	2, 3, 4	Present
	Below H.W.	Pairs 4, 5, one 6	4, 5, 6	1c–6	Present

Just as there is a distinct race of *cerberus* on St. Mathias Island, so also *illudens* varies in a similar manner, being notably greyer-brown than the nominotypical form, especially towards the apex of the fore-wing. This subspecies is here described as *mathiasana*.

Euploea illudens mathiasana subsp. n.

There are seven males at South Kensington, and at Tring seven males and four females from which ♂ holotype is chosen, collected by Eichhorn, June–July 1923. The specimens are slightly smaller, greyer-brown, especially towards the apex of the fore-wing, and the spots on the whole more noticeable. On the underside there is little difference in colour from *i. illudens*.

			Admarginals	Submarginals	Discals	Cell spot
♂ holotype *illudens* ♂ *mathiasana*	Above	F.W.	Nil	3–7 (4, 5 the smallest)	Nil	Nil
		H.W.	Nil	Small 6	Nil	Nil
	Below	F.W.	Nil	3–8 (subequal)	2, 3, 4 (all small, 2 dyslegnic and slightly suffused brown)	Small
		H.W.	On R., feebly developed pair 5, one 6 On L., single 6	Minute 3, larger 4, 5, 6	1c–6 (4, 5 minute)	Larger than in F.W.
♂ maximal spotting	Above	F.W.	Nil	3–8	Nil	Nil
		H.W.	Nil	4–6, large and clear	Nil	Nil
	Below	F.W.	Nil	Minute 2, larger 3–8	2–4	Present
		H.W.	Pair 4, 5, single 6	Single 2, pair 3, single 4, 5, 6 (6 largest on wing), minute 7	1c–6, trace 7	Present
♂ minimal spotting	Above	F.W.	Nil	3–7 (5 very minute)	Nil	Nil
		H.W.	Nil	Trace of 6	Nil	Nil
	Below	F.W.	Nil	3–8	2–4	Present
		H.W.	Trace of single 5	4, 5, 6	2–6	Present
♀ maximal spotting	Above	F.W.	Nil	Trace 1b, 2–8	1b, 2, 3, 4, 6 (2 and 6 very faint)	Present
		H.W.	Nil	4, 5, 6	2, 3, and 6	Present
	Below	F.W.	Nil	1b–8	Streak 1b, spots 2, 3, 4, 6	Present
		H.W.	Pairs 4, 5, single 6	3–7	1c–7	Present
♀ minimal spotting	Above	F.W.	Nil	2–6	Nil	Nil
		H.W.	Nil	4 (very faint), 5, 6	Nil	Nil
	Below	F.W.	Nil	1b (trace), 2–6, 8	Nil	Present
		H.W.	On R., pair 4, single 5 On L., pair 4 (all faint)	4–6	2, 3, 6, 7	Present

8. *Euploea* (*Crastia*) *boisduvalii* subsp. *fraudulenta* Butler 1882.

Fruhstorfer (1910 : 244) described as *lystra* a specimen of Lucas' species from Treasury Isle, captured by C. Ribbe. The type is in the British Museum (Natural History), but

after inspection I am convinced that it does not differ sufficiently from many other females of *boisduvalii fraudulenta* to be given a separate name, and *lystra* should be sunk.

Fruhstorfer (1913 : 134) described as *rendovana* a specimen from Rendova Isle which has an accessory sexual brand on the fore-wing in area 1b, posterior to, and smaller than, the normal. I have seen this, and it is merely an individual aberration : there is a second specimen, from the same locality, in the British Museum in which the accessory brand is still smaller : four other specimens from Rendova do not differ from normal *fraudulenta*. The name *rendovana* should be sunk.

9. **Euploea (Crastia) boisduvalii** f. **albomarginata** form. n.

The small race of *boisduvalii* on the Santa Cruz Isles, known as *era* de Nicéville 1902 (? = *torvina* Butler 1875) has a most interesting representative in the Solomons on San Christoval which has developed a white border, thus harmonising with the prevailing tendency in that area (Carpenter 1940 : 308) well shown by the local species *brenchleyi* Butler 1870 and *imitata* Butler 1870. The type specimen, in the British Museum (N.H.), is a female collected by A. S. Meek between 19.iv. and 9.v.1908.

The characteristic white border is a development of a tendency shown in *boisduvalii bakeri* Poulton 1927, of Banks Isles and New Hebrides, as a whitey-brown submarginal area. In *albomarginata* this paler area on the upperside is pure white on the fore-wing with a narrow brown margin of one or two millimetres breadth. On the hind-wing the white area is not so pure white as on the fore-wing but is whiter than in *bakeri*. The white area on the under surface extends to the margins of the wings, but is very slightly suffused with brown at the apex of the fore-wing : on the hind-wing it is more sharply defined proximally than on the upper surface. The spots shown are as follows, on the under surface. Fore-wing. Discals. A streak in 1b and spots of very small size in 2, 3 and the cell. Hind-wing. Discals 3–6 and cell spot. A second female, a paratype, taken on Santa Anna Is. by Woodford agrees with the type.

Male allotype. Through the kindness of Mr. F. E. Watson I have been able to see a male of *albomarginata* from Bauro Is. (= San Christoval), taken on 14.iv.1927, which is in the collection of the American Museum of Natural History. In coloration it resembles the holotype. The spotting, on the under surface, is as follows : Fore-wing, discals 2–3 and cell spot. The spot in 2 is a little more elongated than in the female ; the spots in 3 and in the cell are very small. Hind-wing. Discals 2–6, and cell spot, all small.

The error made by Fruhstorfer (1910 : 241) in placing *proserpina* under *eleutho* has already been noted.

10. **Euploea (Stictoploea) sylvester** Fab. 1793, **magnipunctata** subsp. n.

A large form from the Banks Islands characterised by the strong development of the white spots : on the hind-wing these are considerably elongated antero-posteriorly in areas 1c, 2, and 3. Male holotype. Upperside. Fore-wings intensely blackish-brown with purple suffusion faintly discernible over the distal half. Hind-wings dark brown, without purple suffusion, and slightly paler along the costal border. Spots as follows : Fore-wing. Admarginals faintly showing through from underside ; a few scales make up a bluish point on the left wing just in front of vein 2. Submarginals, 2–7, white, tinted proximally with purple : 2, 3, 5, 7 subequal, 4 minute, 6 the largest and notched externally : 4 and 5 are situated slightly more peripherally. Discals. A small spot at base of 6, a few scales at base of 9, a slightly larger number of scales at base of 10 making a minute costal spot. Brands in 1b well developed : the anterior measuring 14 by 2 mm., the posterior 18½ by 2 mm. Hind-wings. Submarginals greatly developed, forming a striking feature. A pair in 1c, 2, 3, much elongated proximally. The largest, the anterior one in 3, measures 4 mm. in length and 1½ mm. in breadth : the smallest, and most posterior, 2 by 1 mm. A large spot,

notched distally, in 4, 5, 6. Discals, a small 7. Underside. Less difference in colour between fore- and hind-wings, both blackish-brown and darker from base to outer margins of discals. Area 1a of fore-wing dull white over basal three-quarters: on hind-wing a dull white suffusion forms a narrow band along basal half of costal margin of area 8. Spots as follows. Fore-wing. Admarginals. The anterior member of a pair in 1b, pairs 2, 3, and a few minute irregularly distributed spots in 4, 5, 6. Submarginals, as on upperside but slightly larger, with an additional spot in 8. These, like the admarginals, pure white. Discals; a bluish-white basal spot in 2–6 and 9, 10. A triangular bluish-white cell spot. Hind-wing. White admarginals as follows. The anterior member of a pair in 1b, a pair in 1c–5, and the posterior member of a pair in 6. Submarginals, white; a trace in 1b, much elongated pairs in 1c–3, and single spots, notched peripherally, in 4, 5, 6: the most elongated is the anterior member of the pair in 3, measuring 5 mm. Discals. Trace 1b, elongated dull white pair 1c, single bluish-white spot 2–7. Cell spot bluish-white. In addition, small spots at roots of wings as follows: Fore-wing, a linear mark 1 mm. long posterior to root of median vein. Hind-wing, a spot in 1a, 1c, and 8.

The female allotype is also described as it differs somewhat from the male. Dark brown without purple suffusion; hind-wing paler distal to spots. Fore-wing spots on upperside more conspicuous than in male, and so faintly purple-tinted that they seem to be a purer white than those on the hind-wing which look dull white by comparison. Spots as follows: Fore-wing. Submarginals larger than in *s. tristis*; a few scales only in 1b; 2, 3 and 6 subequal; 4 and 5 much smaller and situated more peripherally; 7 little larger than 5; 8 minute. A few scales mark the cell spot which also shows through from below. Hind-wings. Submarginals, paired in 1c, 2, 3, single in 4, 5, 6: not so elongated as in male the longest (in 2) measuring 3½ mm. The discals show through from below.

Underside: coloration much as above. Inner margin of fore-wing dull white over most of 1a. Discals and cell spots on both wings faintly bluish-white, others white. Spots as follows: Fore-wing. Admarginals. The anterior member of a pair in 1b, pairs 2, 3, posterior member of a pair in 4 on right wing only. Submarginals, 1b–8. The two extremes about the same small size, 2, 3, 6 larger, 4 and 5 intermediate and more peripheral, 7 about the same size. Discals. An elongated streak in basal half 1b, spots in 2–6, 9, 10. Cell spot present. Hind-wing. Admarginals. The anterior member of a pair in 1b, pairs 1c–5. Submarginals. A faint one in 1b, elongated pairs 1c–3, the longest (in 3) measuring 4 mm.; single spots 4, 5, 6. Discals. A pair of linear markings in 1c, single spots 2–7, 7 largest. Cell spot of irregular shape. In addition, basal spots in 1a, 1c, and 8, and on root of subcostal vein.

Holotype male. Banks Islands: Ureparapara, forest about 20 feet above sea-level, *J. R. Baker*, 30.ix.1922. Oxford University Museum.

Allotype female. Banks Islands: Pakea, *H. W. Simmonds*, 27.xi.1923, Oxford University Museum. Paratypes, in Oxford Museum. Males. Two, Ureparapara, *J. R. Baker*, 30.ix.1922. Two, Pakea, *H. W. Simmonds*, 27.xi.1923. Females. Three, Pakea, *H. W. Simmonds*, 27.xi.1923.

Among these paratypes one male has the spots even larger than in the holotype, except for the anterior discals on the upperside of the fore-wing, which are only just visible: on the hind-wing the anterior submarginal in 3 is nearer 5 than 4 mm. long. In other paratypes the enlargement is less than in the holotype although always greater than in *s. tristis*. Among the female paratypes one has the anterior discals on upperside of fore-wing slightly larger than in allotype, and the pair of submarginals in 2 on the hind-wing are joined proximally. This is interesting because this new subspecies, *magnipunctata*, is obviously transitional from *s. tristis* to *s. pelor* Doubleday 1847, of North Australia, in which the enlargement is carried further, although the paired spots still retain their identity. In *s. sylvester* Fabricius 1793 they are completely merged into one, except for a notch at the distal end.

The new subspecies also differs from *pelor* by showing less difference in size between members of the submarginal series on upperside of fore-wing. In *pelor* 4 and 5 are disproportionately small, and in *sylvester* they have almost, and in some specimens quite, disappeared.

A female of *pelor* from Darwin is more like those from Pakea than are the respective males, but the spots in fore-wing areas 2–3 above are more elongated in *pelor*; the contrast between the spots in 4–5 and the others is less marked than in the males. The admarginals on the underside are much better developed in *pelor* than in *magnipunctata*, in which, also, they are more developed than in *s. tristis*.

The female *magnipunctata* has a white streak on the under surface of area 1b of the fore-wing, anterior to the white border, as in *s. tristis*, but in *pelor* this is represented by its outer extremity only, as a bluish-white dot of the discal series. In this respect the only female *sylvester* at Oxford has developed further than *pelor*, for the streak is quite absent.

It seems that *magnipunctata* is a step in the development of *sylvester* through *pelor*, and it is interesting that this form has not been found on the more southern isles of the New Hebrides group. A male and female *s. tristis* at Oxford, from Aoba Is., east of Espirito Santo, show decided transition between *tristis* and *magnipunctata*: the spots on the hind-wing are slightly larger than in *tristis*. The largest of the submarginals, in area 3, measures 3 mm. in length in male and female. In the series of 38 *s. tristis* at Oxford these paired spots in 1c–3 are scarcely, if at all, elongated, the maximal length on the upperside being 2 mm., the spot being so little elongated that it is almost circular. A specimen at Oxford from Fergusson Island, off the south-east end of New Guinea, captured by Meek, is interestingly transitional to *doleschalii* Felder 1859. It has, on the fore-wing, only minute submarginals in 2–3, but they are well developed in 6–7: on the hind-wing the submarginals in 1c, 2, 3 are considerably elongated, the longest measuring $3\frac{1}{2}$ by 2 mm. The posterior border of the hind-wing shows the paler brown characteristic of *doleschalii*: the spotting of the underside, with the exception of the remarkably developed submarginals of the hind-wing, agrees with that of *doleschalii* rather than of *tristis*.

There is little doubt that many species and forms besides those mentioned here could be sunk under the one species *melina* Godart 1819.

11. **Euploea (Calliploea) tulliolus** F. 1793 **goodenoughi** subsp. n.

I am greatly indebted to Dr. Karl Jordan, F.R.S., for letting me see the unique specimen, in the Tring Museum, now described as a new subspecies. Dr. Jordan showed it to me for comparison with *E. jennessi*, recently described (Carpenter 1941), but close study identified it as a member of a different group. The specimen, captured on Goodenough Island (*A. S. Meek*) at 2500–4000 feet elevation, March–May 1913, is a female in good condition and is the sole representative of the *tulliolus* complex yet known from Goodenough. Mr. G. Talbot, who kindly compared the specimen with other *tulliolus* forms in the British Museum (N.H.), is of the opinion that it is nearer to *darchia* McLeay 1827 from Australia than to any other named form of *tulliolus*; but in my opinion it differs in several important characters. It has considerable resemblance to its nearer geographical relations on the eastern part of New Guinea. The description of this holotype female is as follows: General ground-colour of upperside brown, as in *darchia*, without any purple gloss. On the fore-wing, along vein 2 and contiguous to the posterior border of the white spot in area 2, there is dull yellow suffusion, and on the hind-wing there is a faint dull yellow tint in area 6 and in areas 2, 3, 4, where the submarginals show faintly. Spots as follows: Upper surface. Fore-wing. Submarginals large and conspicuous as in *darchia*, white. 1b and 3 comparatively small, 2 large, 4–8 rather elongated and narrow, 6 being longest: there is a trace only of 9. There is a strong difference from *darchia* in that costal 10 is not represented, whereas it is a feature of all Australian forms. It is also absent from the New Guinea

forms *doryca* Butler 1878, and *dudgeonis* Grose-Smith 1894. Hind-wing. Very faint, yellowish, traces of paired submarginals 2, 3 and single 4, 5. A small spot in 6 is white. The hind-wing provides a very decided difference from *darchia* in which the submarginals form a conspicuous white band, but it is noteworthy that traces can just be seen in *goodenoughi*. Under surface. Fore-wing. Some unusual features here. Area 1a is dull brownish-white; in 1b a dull white patch occupies the middle third and a similar patch occupies the middle third of 2, joining the submarginal. These two patches owe their dull white tint to a faint trace of purple colour. There is a narrow discal 3, flattened antero-posteriorly. I have not seen a discal 3 in any other specimen of the *tulliolus* complex. Costal 10 is absent. Hind-wing. The only spot is a very small submarginal 6; the traces on the upperside are not visible below. The complete absence of all admarginals constitutes a striking difference between *goodenoughi* and *darchia*: *doryca* has them in fair number: the only specimen of *dudgeonis* at Oxford has none.

12. **Euploea (Calliploea) pumila** Butler 1866 **manusi** subsp. n.

A series of nine males from the Admiralty Isles, Manus, seems sufficiently distinct to be described as a subspecies. They are in the Tring Museum. The general coloration is a darker purplish-brown than that of *p. bismarckiana* Ribbe 1898, and the hind-wing is more strongly spotted. The new subspecies approaches *p. jamesi* Butler 1876 in the larger size of submarginal 6 on upperside of fore-wing, being intermediate between *jamesi* and *bismarckiana*, and has larger anterior submarginals on hind-wing below. Type and eight paratypes collected by Meek, Sept.–Oct. 1913.

			Admarginals	Submarginals	Discals	Cell spot
Type	Above	F.W.	Nil	2–7 blue to bluish-white, 6 largest	Nil	Nil
		H.W.	Nil	4–6 white	Nil	Nil
	Below	F.W.	On R., single 2, pairs 3–6, one 7	4–7, 6 largest	10	Nil
			On L., single 3, pairs 4–6, one 7			
		H.W.	Pairs 1c–4, single 5	4–7, white, larger anteriorly	Nil	Nil
Maximal spotting	Above	F.W.	Nil	2–7, 6 much largest	Nil	Nil
		H.W.	Nil	Pair 3, singles 4–6	Nil	Nil
	Below	F.W.	Single 2, pairs 3–6, single 7. All small	2–5 very small, 6 larger, 7 small	10	Nil
		H.W.	Pairs 1c–6	Faint 2, pair 3, 4–7, conspicuously white and larger anteriorly	Nil	Nil
Minimal spotting	Above	F.W.	Nil	4–7	Nil	Nil
		H.W.	Nil	4–5	Nil	Nil
	Below	F.W.	Pair 3–4 minute	3–7, all minute except 6	10	Nil
		H.W.	1c–5 weak and irregular	4–7	Nil	Nil

13. **Euploea (Salpinx) nemertes** Hübner 1806 **pulchella** subsp. n.

A series of specimens in the British Museum, taken by Eichhorn in June–July, 1923, on Mathias Isle in the Bismarck Archipelago is distinct enough to be separated as a geographical race. There are six males at South Kensington, and nine males and four females at Tring. The race is of small size, even smaller than *n. perdita* Butler 1882 and is charac-

terised by its lighter brown colour, becoming quite a golden brown distal to the cell of the fore-wing. The discal spot in 1b of fore-wing is small. The yellow sex-patch on the hind-wing covers the bases of areas 5, 6, and part of 7, and extends into cell as far as its longitudinal diameter. External to this yellow area the wing is silver grey to just beyond spot 6, and almost to posterior border of cell.

			Admarginals	Submarginals	Discals	Cell spot
♂ type	Above	F.W.	Nil	2–7, trace 8	Nil	Nil
		H.W.	Nil	6	Nil	Nil
	Below	F.W.	Nil	2–8	2, 10	Nil
		H.W.	One in 3, 4 (minute)	Pair 2–3, singles 4–7, increasing anteriorly, slightly blue	Nil	Nil
♂ maximal	Above	F.W.	Nil	Large 2–6, small 7, 8	Nil	Nil
		H.W.	Nil	4, 5 (minute), 6	Nil	Nil
	Below	F.W.	Single 1b, pairs 2–6, single 7	2–8	2, 10	Nil
		H.W.	Pairs 3–4, single 5	Minute 1c, pairs 2–3, singles 4–7, increasing anteriorly	Nil	Nil
♂ minimal	Above	F.W.	Nil	2, 3, 6	Nil	Nil
		H.W.	Nil	4–6 (very small)	Nil	Nil
	Below	F.W.	Nil	2–8	2 (trace)	Nil
		H.W.	Nil	Pairs 2–3, singles 4–7	Nil	Nil
♀ maximal	Above	F.W.	Nil	2–8	10 (faint)	Nil
		H.W.	Nil	4–6	Nil	Nil
	Below	F.W.	Nil	2–8	2, 10	Nil
		H.W.	Singles 2–3, pair 4	Single 1c, pairs 2–3, singles 4–7	Nil	Nil
♀ minimal	Above	F.W.	Nil	2, 3, 6	Nil	Nil
		H.W.	Nil	4–6 (very small)	Nil	Nil
	Below	F.W.	Nil	2–8	2 (trace)	Nil
		H.W.	Nil	Pairs 2–3, singles 4–7	Nil	Nil

The adjacent Squally Isle has somewhat similar specimens (males four and females three, at Tring), intermediate between *n. perdita* and *n. pulchella*.

14. *Euploea* (*Salpinx*) *nemertes graeffiana* Herrich-Schaeffer (1869).

The name "*graeffiana* H.-S." commonly applied to the race of *nemertes* characteristic of the New Hebrides group of islands must be given up, as it is a synonym of *macleayi* C. & R. Felder 1865. The matter is complicated, and I am indebted to Dr. B. M. Hobby for assistance in solving questions of nomenclature.

1. C. and R. Felder (1865—see references at end) described as *macleayi* a form of *nemertes* from "Ins. Fidschi" which is characteristic of those islands.

2. Graeffe (1868) gave an account of a journey in Viti-Levu, Fiji, and certain insects then collected are described, figured, and named. The last of these is named "*Euploea Graeffiana* Hr." The figure illustrating the notes agrees with the ordinary Fijian specimens, named *macleayi* by C. and R. Felder in 1865. There appears to be a small error in the plate, for a spot is figured on the inner margin of the fore-wing in area 1a. I have examined many hundreds of *nemertes*, of various forms, and have never seen a spot in this position: it appears to be that of area 6 of the hind-wing transferred to the fore-wing. The name *graeffiana* cannot stand. The author of the description of this butterfly (in a paper on

Fiji) has apparently confused its locality with that of other insects, from Samoa, described in the same paper, for he alludes to it in his note on the plate as "Die von Herrn Dr. Graeffe auf Samoa entdeckte Art." No butterfly of this type is known from Samoa, however.

3. Dohrn (1868) discussed Graeffe's paper and concluded (p. 202) that the description, and name *graeffiana*, were both by Heer, although it is not so stated in the text. Dohrn, reasonably, considered that the abbreviation "Hr." referred to Heer.

4. Herrich-Schaeffer (1869A) rather guardedly adopted Dohrn's view that Heer was the author of the name *graeffiana*, but used the name Heer in brackets with a ?. He figured (on Plate 2, fig. 5, not, as he stated, on Plate 1, fig. 1) the underside of a specimen stated to come from "Vanua Valava." This introduces a new complication: the author in his first paragraph indicated that he is referring to a collection made by Graeffe "von den Viti-, Tonga- und Schiffer Inseln" (*i.e.* Fiji, Tonga, and Samoa), but says the specimen came from "Vanua Valava." This name is not used at the present day but can be found in other German writings (*e.g.*, Fruhstorfer, 1900, *Berlin ent. Z.* **45** : 7) as a locality for *tulliolus seriata* Herrich-Schaeffer 1869. The name refers to Vanua Lava in the Banks group. It is possible that Herrich-Schaeffer was confused between "Vanua Valava" and Vanua Mbalavu, the latter locality being in the Fiji Isles. Vanua Mbalavu can easily become Vanua Balavu, which is readily confused with "Vanua Valava." Since the butterfly figured by Herrich-Schaeffer is of the usual Fiji type, and is not known on either Tonga or Samoa, it may be presumed that the confusion lies in the similar geographical names.

Herrich-Schaeffer's specimens were formerly in the Godeffroy collection at Hamburg, but an enquiry in 1930 elicited the reply from Professor Dr. E. Titschack that the Hamburg Museum contained no Fijian specimens of *nemertes*. However, a clue was provided by Van Eecke (1916 : 257) who, discussing collections in the Leiden Museum, alluded to a male and female of *graeffiana* acquired *ex* coll. Godeffroy in 1886. Through the kindness of Dr. Boschma of that museum I was enabled to see these specimens in 1938 : they bear MS. labels with name *graeffiana* and as they also correspond with the description by Heer they are quite possibly the original types named by him. They are labelled "Samoa", which is certainly an error, but accounts for Heer's words quoted in (2) above.

5. Herrich-Schaeffer (1869B) gave a coloured reproduction of his former plate but definitely assigned the name *graeffiana* to Heer, repeating the name of the locality as Vanua Valava.

6. Butler (1874 : 276) referred to Herrich-Schaeffer's account and quoted the locality but introduced a new complication by referring to the insect as *graeffiana* Herrich-Schaeffer, ignoring Heer.

7. Butler (1876 : 251), in an account of a collection from New Hebrides, identified (wrongly) specimens as *graeffiana* (*i.e. macleayi*) but alluded to them in a way which shows that he had another form, the one now known to be characteristic of that locality and not then known to science. He mentioned as a character (by which it can be distinguished from the closely allied *iphianassa* Butler 1866) "the pale external area of the wings." This character also distinguishes it from *graeffiana* Heer.

8. Butler (1878 : 293) discussed a specimen from "Vaté, New Hebrides" which he said is readily recognised by "the pale borders to its wings."

9. Butler's mistaken confusion of the markedly pale bordered New Hebrides race with the Fijian race in which the borders are less pale led to the name "*graeffiana* H.-S." (*recte* Heer) being universally adopted for the former, whereas it belongs to the latter and sinks as a synonym of *macleayi* C. & R. Felder 1865. The New Hebrides race therefore requires a name, and I now describe it as *novarum-ebudum*, selecting the two males discussed by Butler 1876 as holotype and paratype.

Euploea nemertes Hübner 1806 **novarum-ebudum** subsp. n.

Differs from *n. macleayi* C. & R. Felder 1867 by smaller size and very decided pale borders to the wings, the proximal edge of the pale border being proximal to the row of submarginal spots: the pale border is more clearly defined on the fore-wing. The ground-colour is decidedly lighter than in *macleayi*. Coloration on the under surface as on the upper; but on the fore-wing area 1a, the posterior half of 1b, and anterior half of 1b as far outwards as the sex-patch are dull white. The oval patch on fore-wing in area 1b measures 3 by 1 mm. and is the only spot on the wing to show a faint violet tint. The yellow sex-patch on the hind-wing only occupies the outer half of the cell, the posterior half of the cell being grey-black, which also extends over bases of areas 4, 5, 6. Spots as follows, white. Upper surface. Fore-wing. Submarginals 2–5 of equal size, 6–8 larger and of about equal size. Discals. Costal 10 clearly defined, round. Hind-wing. Submarginals. 2–3 faintly showing through from below; 4–6, small. Under surface. Fore-wing. Spots as on upper surface but slightly larger. Hind-wing. Submarginals. Pairs 1c–3, white. Single spots 4–7, slightly tinted with violet in increasing amount towards costal margin.

Male holotype and paratype from New Hebrides: Havannah Harbour, Vaté (*A. Corrie*) in British Museum, No. 75–93. Paratype only differs from type by absence of submarginals from area 1c on underside of hind-wing. These are the specimens mentioned by Butler in 1876 as being new to the British Museum.

			Admarginals	Submarginals	Discals	Cell spot
♂ maximal	Above	F.W.	Nil	Small 2; 3–5, 6–8 larger	6, 9, 10	Nil
		H.W.	Nil	2–3 (faint), 4–6	Nil	Nil
	Below	F.W.	Nil	2–8 subequal	2, traces 6, 9, 10	Nil
		H.W.	Minute pair 3, single 4 (exceptional)	Pairs 1c–3, singles 4–7	Nil	Nil
♂ minimal	Above	F.W.	Nil	4, 5, 8 minute, 6, 7 the only conspicuous ones	Nil	Nil
		H.W.	Nil	Nil	Nil	Nil
	Below	F.W.	Nil	Small 4, 5, larger 6–8	2, 10	Nil
		H.W.	Nil	Pairs 2, 3, singles 4–7	Nil	Nil
♀ maximal	Above	F.W.	Nil	2–8 large (6–7 confluent)	9, 10	Nil
		H.W.	Nil	Large 1c, pair 2 (joined at base), pair 3, singles 4–6	Nil	Nil
	Below	F.W.	Nil	2–8 large (6–7 confluent)	2, 10	Nil
		H.W.	Nil	1b, 1c, pair 2 (joined at base), pair 3, singles 4–7	Nil	Nil
♀ minimal	Above	F.W.	Nil	2–7 (indistinct)	10	Nil
		H.W.	Nil	Pairs 2–3, singles 4–6	Nil	Nil
	Below	F.W.	Nil	2–7	Minute 2, 10	Nil
		H.W.	Nil	Pairs 2–3, singles 4–6	Nil	

Summary.

1. The following new subspecies or forms are described. *Euploea honesta apicalis, cerberus griseitincta, helcita lauensis, illudens mathiasana, boisduvalii albomarginata, sylvester magnipunctata, tulliolus goodenoughi, pumila manusi, nemertes pulchella, nemertes novarum-ebudum.*

2. The following errors are corrected. Fruhstorfer wrongly put *mangoensis* Butler under *climena*: it is a form of *boisduvalii*: he put *proserpina* Butler under *eleutho* instead of under *boisduvalii*. Hulstaert placed *prusias* Godman & Salvin and *pronax* Godman & Salvin under *honesta* instead of under *nechos*.

3. The following names are sunk as synonyms. Fruhstorfer's *bigamica* male = *honesta*; *decipiens* Butler = *illudens*; *lygdamis* Fruhstorfer = *illudens*; *lystra* Fruhstorfer and *rendovana* Fruhstorfer = *boisduvalii fraudulenta*; *graeffiana* Herrich-Schaeffer = *nemertes macleayi*.

APPENDIX

By G. Talbot, F.R.E.S.

Euploea helcita lauensis subsp. n.

♂♀. Connects *eschscholtzi* C. & R. Felder, from the western Fiji Is., with *distincta* Butler from the Ellice Is., and is nearer the former. Fore-wing with discal spot in area 3 more or less dusted with black as in f. *indistincta* Moore in which, however, the spot is smaller; spot in area 2 rarely darkened; subapical spots sometimes dusky. Hind-wing post-discal spots mostly larger than in either of the two allied forms, and antemarginal spots equally as strongly marked.

This form somewhat resembles *indistincta* but the latter has discal spot on fore-wing smaller, and antemarginal spots reduced to minute dots.

Habitat.—Lau Islands, eastern Fiji group, Vanua Balavu and Mania. Vanua Balavu, April, 1931 (*R. J. A. Lever*), ♂ type. Lomaloma, south-east of Vanua Balavu, 1.ii.1922 (*H. S. Evans*), ♀ allotype (with discal spot less darkened).

A series of males and 1 ♀ in Hope Dept.

Specimens of the larger-spotted race *walkeri* Druce occur rarely in the Lau Is.

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Book Notice.

College Entomology. By E. O. Essig. pp. vii + 900, 308 figs. 8vo. New York (Macmillan), 1942. Price $5.

This book is said by the author to contain the ". . . essential facts about insects with which every well-informed person should be familiar." "It is obvious that among the half million described species of insects many omissions are to be expected, but whatever species are here included have been selected for one of three reasons: (1) long associations with the human race; (2) some peculiarity in form, size, color, habits; or (3) [are] interesting and typical examples of a family."

The book contains 36 chapters, of which the first three deal with Metamorphosis, Anatomy and Classification, and the remainder each with an Order from the Protura to the Siphonaptera. An index of authors in three columns occupies 5 pages and an index of subjects also in three columns extends to no less than 63 pages.

The end papers of the book carry a coloured map of the zoogeographical regions of the world. Protest is again registered against this practice of utilising end papers for matters of permanent interest. It is difficult to see how the binder can preserve the pages adequately when rebinding the book.

Each of the chapters devoted to an Order of insects opens with the derivation of the name and usually an indication of the insects contained in the order and the French and German name. A short description follows, to which is added a general description with an indication of the habits and number of described species. A key to families is given and then each family is dealt with individually, and the leading types are illustrated. At the conclusion of each chapter a list of selected references is given, and at the end of the book a short list of General References.

A large number of misprints have been noticed in the book, especially in the references and particularly in the German titles. Other misprints to which attention may be called are the date of the establishment of the Order Blattaria Burmeister wrongly credited to the year 1929, and the misspelling Neuoptera on p. 148. In the list of references to the literature on Termites it is difficult to understand the inclusion of Hagen's *Bibliotheca Entomologica* with a full collation; would the list of General References not have been a more appropriate place?

The book is very well printed and the many illustrations are for the most part original.

CAMAROTA CURVIPENNIS LATREILLE (DIPT., CHLOROPIDAE), AND ITS MISQUOTATION

By R. L. Coe.

(*British Museum, Natural History.*)

Camarota curvipennis, originally described as *Oscinis curvipennis* by Latreille (1805), has been misquoted by several authors as *C. curvinervis*. Hendel (1910) appears to have committed the original error. Collin (1911) gives the correct name. Duda (1933 : 114) follows Hendel's rendering of the name, besides misquoting the date of Latreille's description of the species as 1804, an earlier error of Becker to which Collin (1911) draws attention. Duda (1933 : 115) considers Zetterstedt's (1848) *Oscinis curvinervis* (*curvinervi*) to be a redescription of Latreille's " *curvinervis* " (i.e. *curvipennis*), but elsewhere (p. 120) in the same work he correctly ascribes *O. curvinervis* (*curvinervi*) to Zetterstedt and places it as a synonym of *Meromyza saltatrix* Linnaeus var. *nigriventris* Macquart; while it is quite likely that this synonymy is correct, it is quite certain from Zetterstedt's description of *curvinervi* that *curvipennis* Latreille represents a different species. Séguy (1934) wrongly quotes Latreille's species as *curvinervis*, and incidentally sinks *Camarota* Meigen as a synonym of *Oscinis* Latreille, a wrong procedure based on an error of Becker as shown by Collin (1911).

In the British Museum the name *Camarota curvinervis* has been applied erroneously to Latreille's *C.* (*O.*) *curvipennis* through the use of Duda's (1933) Chloropidae keys. As a consequence, a specimen of *C. curvipennis* submitted by Goodliffe was identified as *curvinervis*, and this incorrect rendering of the specific name appeared in his 1942 paper. The writer's thanks are due to Miss R. M. Davenport, of the Imperial Institute of Entomology, who drew his attention to this unfortunate discrepancy in the literature.

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A NORTHERN RECORD OF *ANOPHELES GAMBIAE* GILES (DIPT., CULICIDAE)

By D. J. Lewis, M.A., F.R.E.S.

(*Entomologist, Sudan Medical Service.*)

As far as the writer is aware, *Anopheles gambiae* has hitherto been recorded neither from Egypt nor from any part of the Ethiopian Region farther north than Zeidab (17° 26′ N., 33° 54′ E.). In May 1941 two males and four females, obtained near Wadi Halfa, were received for determination from Dr. R. T. Campbell. They had been bred from larvae collected in river pools about

eight miles north of the town between the villages of Ashkeit and Dubeira. This point is a few miles south of the Egyptian frontier, and presumably the species could exist north of the frontier if small temporary pools should occur.

De Meillon (1942, *Publ. S. Afr. Inst. med. Res.* **23** : 213), discussing the distribution of *A. gambiae* near its southern limit, in the Transvaal, states that as far as is known the species is present only in summer in the area with a range of temperature between 41° F. (22·8° C.) and 45° F. (25·0° C.) and with 0 to 50 days of frost a year. Wadi Halfa has from 0 to 2 days of frost a year and a temperature range of 33·6° C. (60·5° F.), the difference between the mean maximum for June and the mean minimum for January (1902 to 1934).

Book Notice.

The Plant Bugs, or Miridae, of Illinois. By Harry H. Knight. *Bull. Illinois nat. Hist. Surv.* **22** : 1–234, illust. 1941.

This monograph of the largest family of the Hemiptera deals with 440 species of the family either so far recorded from Illinois or, in the view of the author, likely to be present in the State.

In North America about 1500 species of Miridae have been recorded against some 2500 species of all remaining families of Hemiptera.

This monograph is written mainly on the material especially collected by the author and other entomologists over a period of 10 years during which about 20,000 specimens were obtained. Due attention was paid to field work on the bugs and the results of this are incorporated in the work.

Keys to the subfamilies, genera and species are supplied throughout the book and many illustrations are given which should make easy the identification of any species that comes within its scope.

Book Notice.

Dictionary of scientific terms as used in the various sciences. By C. M. Beadnell. 2nd edition. pp. x + 232 + 13. sm. 8vo. London (Watts & Co.). (Thinker's Library 65.) (1942.) Price 2*s*.

This work was first published in 1938 and a notice is given in 1938, *Proc. R. ent. Soc. Lond.* (A) **13** : 99. A new edition has become necessary and advantage has been taken to add a Supplement of 13 pages. The terms included in the Supplement are primarily of interest to physicists or to those who require a definition of terms used in Physics.

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Smith, A., 1936, New species of Coccidae, *Proc. R. ent. Soc. Lond.* (B) **6** : 301–306, pl. 1.

——. 1936, New species of Coccidae, *Trans. R. ent. Soc. Lond.* **84** : 901–936.

Titles of periodicals cited are to be abbreviated in the manner indicated in the *World List of Scientific Periodicals, 2nd edition*, 1934.

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WEDNESDAY, October 7
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